should include latitude and longitude and should be tied to a physical attribute where available, such as milepost marker.

- The facility owner/operator captures the following information to ensure project safety in the plan, design, construction, documentation, location, and maintenance of their longitudinal utility.
  - *Any new construction into the electronic mapping database at the time of installation.*
  - *The location of abandoned or sold facilities is retained in the database.*
  - *The electronic mapping database includes the following detailed information:*
    - Engineering stationing and milepost/marker post location, with latitude and longitude. Common mapping coordinate systems that allow conversion to latitude and longitude are used.
    - Alignment of the utility with engineering stationing at each running line change or PI (point of inflection) including signs and markers.
    - Bridges, culverts and rivers.
    - All road crossings, overhead viaducts and underpasses, including name of the street (public or private) and mile marker/marker post designation.
    - Small scale maps showing the overall utility route.
    - Physical characteristics and attributes of the system such as: pedestal, pole, transformer, meter numbers, anode bed, size, material, product and pressure.
    - The number of utility lines or conduits owned by the facility owner/operator in a corridor or the size of the duct package/bank.

## Project Owner

- The project owner provides the excavator with accurate location information on the proposed excavation area using mapping information utilized by the one-call center. This information includes: a street address, street intersection, legal description, or other acceptable one-call format and latitude/longitude if feasible.
- The project owner determines a starting point, ending point and on which side of the property (North, South, East, West, front, back, rear, sides, etc.) or street the excavation area is located.

## Emerging Technologies

Technology is rapidly changing. Although the following technologies are now used in other applications, their use is not widespread in the damage prevention field.

- Geographic Information System (GIS)
- Advances in Location Technology
- The Global Positioning System (GPS)
- Orthographic and Satellite Images

Advanced use of these technologies in combination with advances to locating technologies is expected to reduce damage to underground facilities.

CGA
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**Call, Design, Locate, and Dig Safely**

# Mapping

## UNDERGROUND FACILITIES DAMAGE PREVENTION BEST PRACTICES

# Mapping

## BEST PRACTICES

**Whether you are a facility owner or operator, locator, design professional, one-call center employee, excavator, contractor, or other stakeholder, ensuring the safety of those who work or live in the vicinity of underground facilities and protecting vital services is everyone's responsibility.**

**The Common Ground Alliance is a nonprofit organization dedicated to shared responsibility in damage prevention. The purpose of the CGA is to ensure public safety, environmental protection, and integrity of services by promoting effective damage prevention best practices.**

**This brochure provides a brief review of the damage prevention best practices associated with mapping underground facilities. These Mapping best practices are listed in five distinct responsibility areas: one-call center, locator, excavator, facility owner/operator, and excavation project owner. For more detailed information on all of the damage prevention best practices, please visit the Common Ground Alliance Web site at: www.commongroundalliance.com.**

## One-Call Center

A one-call center uses an electronic mapping database system that includes the following:

- Accuracy - The land base is the most precise geographical information available to the center.
- Latitude/Longitude (Lat/Long) - The land base and database are able to produce Lat/Long information based upon street address, street/road name, intersection, milepost marker, etc. It is also possible to determine the street address, street/road name, intersection or milepost based upon Lat/Long information. The translation of Lat/Long information is automatic. A map point (i.e., a rural area not in the immediate vicinity of a road or known map landmark) can be identified by Lat/Long information.
- The land base is kept up-to-date, including a process that periodically adds new street information, name changes, aliases, and municipal boundaries.
- The database is promptly updated as information is provided or becomes available from the facility owner/operator. The system is able to accept information in standard file format with minimal human intervention.
- Location Area - The electronic mapping system is able to produce a ticket for the smallest practical geographical area.
- Availability - The land base is available to the public for the identification of the excavation area. The land base and database are available to the one-call center membership for the update of member database information.

## Locator

Locators use maps to assist in finding the excavation site and to assist in determining the general location of the buried facility.

- Locators are trained in map reading and symbology to assist in determining the location of the buried facility.
- The locator provides to the facility owner/operator the most precise facility location information obtained from a locate when there is a discrepancy.
- The locator provides feedback to the one-call center on land base mapping and location discrepancies.

## Excavator

- The excavator takes responsibility for giving accurate location information to the one-call center. This information includes street address, street intersection, legal description, or other acceptable one-call format and latitude/longitude if feasible.
- The excavator provides a starting point and ending point, and on which side of the property (North, South, East, West, front, back, rear, sides, etc.) or street the excavation area is located.

If the excavator can not meet the above criteria, the excavator directly coordinates with the one-call center to establish the excavation area.

## Facility Owner/Operator

- The facility owner/operator provides the one-call center with data that will allow proper notification of excavation activities near the facility owner/operators' infrastructure.
- The facility owner/operator provides access to a mapping system that can be utilized by both the locator and the facility owner/operator.
- The facility owner/operator requires the designer to adhere to the facility owner/operator's mapping standards.
- The facility owner/operator provides consistent, current information to the one-call center for the proper receipt of ticket notification. Basic information